IV. When Songbirds Sing the Blues

SCHOOLYARD BIRD SURVEY

Conduct a scientific survey of bird populations in the schoolyard

Objectives

Students will:

- conduct a scientific investigation of the birds that frequent their school neighborhood.
- apply field research techniques to compile data on birds in their survey sites.

Subjects

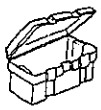
Science, Math

Suggested time

1-3 hours

Materials

In Kit:



- Bird Survey Data Sheets (copy 1 for each team of 4 students)

Provided by Teacher:

- Clipboards - 1 per team
- Flagging - Sticks with flags to mark study sites. Try to mark each route with a different color.
- Pencils
- Binoculars (optional)
- Field guides
- Field Guide to Common Birds of Our Schoolyard - optionally prepared ahead of time
- Stop watches or watches with second hands (1 for each team)

Setting

Schoolyard

Teacher Background

Bird Monitoring Studies

As the result of bird monitoring projects, scientists and birdwatchers have recently become concerned about the declining populations of many Neotropical migratory birds. Each year ornithologists and birdwatchers conduct large-scale bird surveys in order to monitor changes in populations. The results of these surveys can alert people to possible threats to bird species and help to determine management practices. Most bird monitoring programs are cooperative efforts among volunteers, federal and state resource agencies.

Breeding Bird Survey

The Breeding Bird Survey (BBS) is a bird count conducted each year since 1966 by volunteers under the direction of the U.S. Fish and Wildlife Service and now by the National Biological Survey. The BBS is conducted during the breeding season from mid-May to mid-July. Volunteers travel in vehicles along 3000 separate 25 -mile routes across North America recording the number of each bird species observed at half-mile intervals. Teams of observers and recorders are given a map of a permanently established route with stops every half-mile. At every stop the volunteers make a "point count" of every bird they hear or see in a 3-minute period. Data from the BBS routes over the years has provided some of the best information on population trends for Neotropical migrants. The Breeding Bird Survey has shown declines nationally in the numbers of many birds that breed in the forests and grasslands.

Christmas Bird Count

America's oldest and largest annual birding event, the National Audubon Society's Christmas Bird Count, is a coast-to-coast bird census. Since 1900 the count has occurred on one day during a 2-3 week period in December. The Christmas Bird Count encompasses all U.S. states and Canadian provinces, Guam, Central America and the Caribbean islands. Each count covers a circle of 15 miles in diameter within which birders are grouped into parties to cover specific areas. The birding groups identify and count as many birds as they can and try to estimate how many birds there are altogether. The results are published in *Audubon Field Notes*, the Audubon Society's professional journal. The results have been valuable in tracking long-term population trends in many different species.

Getting Ready

✓ Create a map of the schoolyard survey site. Draw landmark features of the schoolyard, such as the school building, playing fields, playground equipment, trees and shrubs, etc. Try to create enough survey routes on the school ground so that there is one for every team of 4 students. Create routes that are equal in distance for students to walk. Draw the routes on the map.

✓ Draw a separate map for every route. At equal and regular intervals randomly assign 5 stopping points for data collection. Every route should have the same number of stopping points and the same distances between them. Number each stopping point and write some physical description of the site on the map.

✓ Copy a Bird Survey Data Sheet for every team of 4 students.

✓ If desired, prepare ahead of time a Field Guide to the Common Birds of the Schoolyard. Find out what birds students would most likely see. Copy their pictures and descriptive information from a bird field guide

Procedure

Ask students **how do scientists know that bird populations are changing over time? What would be some ways to get that information?** After listing possible strategies, tell students that scientists try to count birds in a systematic or organized way.

Why would counting every bird in an area be difficult? Tell students that one of the big challenges in learning about populations of birds is that it is usually too hard to count all the individuals that make them

up. Birds move around quickly from place to place and are hard to see. Usually no one knows exactly how many birds are in any given area. The changes in both numbers and species of total populations can be estimated by recording just a small number of birds in one place over a length of time.

Tell students that the Breeding Bird Survey is a national bird count conducted each year since 1966 by volunteers. The Breeding Bird Survey is conducted during the breeding season from mid-May to mid-July. Volunteers travel in vehicles along 3000 separate 25 -mile routes across North America recording the number of each bird species observed at half-mile intervals. Teams of observers and recorders are given a map of a permanently established route with stops every half-mile. At every stop the volunteers make a point count of every bird they hear or see in a 3-minute period.

Why do you think the routes are permanent ones that never change year after year and why do the researchers always stop at the same point on the route?

Why are the distances between every stopping point exactly one-half mile? Why do they try to observe birds and record data for the same amount of time, for example for 3 minutes?

Tell students that in order for a scientific survey to be reliable and accurate the study needs to remain the same, or be consistent, year after year and from place to place. **What would happen if researchers stayed at one point for 30 minutes and another point for 3 minutes? What if researchers on one route made 50 stops and people on another route made 10 stops?**

What use would a survey like this be over a period of 30 years?

Explain to students that data from the Breeding Bird Survey routes over the years has provided some of the best information on population trends for Neotropical migrants. The Breeding Bird Survey has shown declines nationally in the numbers of many birds that breed in the forests and grasslands. The Breeding Bird Survey helps scientists monitor population changes, determine management practices, and alert them to possible threats to bird species.

Ask students to write their ideas about where birds like to live, where they might find the greatest number of birds on the schoolyard, the fewest number, etc. Prompt students to give a rationale for their thinking.

Ask students what bird species they would likely see on the schoolyard. Show students or ask them to find pictures in a field guide of the common bird species of the schoolyard.

Tell students they will conduct a mini-bird survey on the schoolyard. They will try to make their surveys as accurate and fair as possible. They will be acting like scientific researchers. Tell students that, like the Breeding Bird Survey, they will doing a point count. At each point on a specific route they will record every bird they see or hear in a three minute period. Because ornithologists use a data sheet to conduct breeding bird surveys, they will also record their observations on a data sheet.

Divide class into teams of four students each. Each team will have one time-keeper, two observers and one recorder.

Roles

Time-keeper - Using a stop watch or a watch, the time-keeper measures a 3 minute period to collect data. The time-keeper tells observers when to start and when to stop.

Recorder - The recorder writes down all the information on the data sheet: the species and numbers of birds observed, habitat features (like trees, shrubs, grass, equipment) and abundance of each feature.

Observers - The observers will tell all the birds they see or hear from their stopping point. They will try to identify the species by name or describe the species as accurately as possible and tell the number of each species.

Have students practice walking their routes. Give each team a copy of their route marked on the maps and 5 flags. Have students walk their routes ahead of time and try to locate each stopping point. Have them place flags at each stopping point with the corresponding number from the map.

As a group, practice observing birds from one point and show students how to record data on the data sheets. Discuss with students good techniques for observing birds. Walking quietly is essential. Talking loudly and making noise can scare away birds. When looking for birds, it is best to stay still. Tell observers to fasten their eyes on one place and watch for any small movements. Then shift their stares to other areas.

What should they do if they don't know what kind of bird it is? Tell students to remember its features and describe it as closely as possible. Make up a name, if necessary.

When ready, have students conduct their bird surveys. Each team will walk the route on their maps, stop at every stopping point, observe and record birds seen and heard for three minutes until all 5 stops are made.

When the data is collected, have student teams share their results with the whole class. Compile all the data on a class data sheet.

Discussion

- **How easy was it to conduct the bird survey?**
- **What were some of the problems they experienced? What could they have done differently?**
- **Were their results similar or different?**
- **Did a specific area have a specific type of bird?**
- **What were the factors that make a better habitat?**
- **What could influence or change the results?**

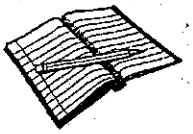
Different observers will have different abilities to hear and see birds.
Time of year is important because birds are more vocal in the spring.
There could be different results in the morning or afternoon.
Birds can be more active in early morning.
There could be different results just before or after recess.
Hearing more than one bird does not mean more are present.
Not hearing or seeing birds doesn't mean none are present.
The same bird may be observed at different times or places by different observers.

- **What are some other ways to survey or count birds?**
- **How might this data be useful?**
- **Would it be interesting or more useful to repeat the survey once a month? every year?**
- **How was our schoolyard survey like the Breeding Bird Survey? How was it different?**

Assessment

Student Reflections

Journal Prompts:



The most interesting or surprising discovery I made was . . .
Something I figured out was . . .
I acted like a scientist when I . . .

Teacher Reflections

- ❑ Were students able to make objective and accurate observations?
- ❑ Were they able to carry out the survey systematically, accurately and thoroughly?
- ❑ Did they keep clear, accurate records?
- ❑ Did they use clear and descriptive language to present results?
- ❑ Were they able to interpret results and draw conclusions supported by data?
- ❑ Did the students allocate responsibilities, involve all team members and stay on task?

Adaptations

For Younger Students

The whole class can observe and count birds regularly on walks through the same area, during an observation period at a feeding station or the some other location over a period of time. Students can tally the birds they see on a simple chart. If the count is made on a regular basis, interesting patterns can be discovered.

Neighborhood Survey

If the school is in an urban area, assign teams to different blocks in the neighborhood. Have students record data at points half-way between each corner. Recruit other adults to accompany each team on their block walks.

Animal Survey

If birds are hard to find, have students count other animal species as well, such as squirrels, dogs, cats, etc.

Recruit Birders

Match up teams with experienced birders who can help students identify species. Call your local Audubon chapter for names.

Branching Out

Christmas Bird Count

Have students find out about this monitoring effort. Invite a member of the local Audubon Society to come talk to students about the local Christmas Bird Count and its results. Have student compare and contrast the Christmas Bird Count with the Breeding Bird Survey.

Breeding Bird Atlas

The Breeding Bird Atlas determines the distribution and reproductive status of breeding birds. Volunteers make a census of a nesting area during the height of the breeding season and search for evidence of breeding. Students can also complete their own mini breeding-bird atlas and map the breeding territories of birds in the spring. Decide on an area to be sampled. Have students prepare maps of the area. Visit the site on repeated mornings. Record the date, time, and weather conditions of the study site for each visit. Have students mark the locations of nests and any activities that indicate breeding, such as carrying food to a nest, singing, gathering nesting material, sitting on a nest. Map where the males are singing and where males battle (usually on the edges of their territories). Draw circles that represent breeding territories. Record other observations in a journal or on a data sheets.

Breeding Bird Survey Web Site

The BBS has a World Wide Web Site that can be accessed on the Internet. Find out current BBS data at this address: http://www.fws.gov/

Bird Survey Data Sheet

Names of Research Team Members _____

_____

_____

_____

Date:	Location:	Time of Day:

Stopping Point	Bird Species	Number (seen or heard)	Habitat Features
1			
2			
3			
4			
5			

Resource List

For Teachers . . .

Reference and Background Reading

DeGraaf, R. and J. Rappole. Neotropical Migratory Bird Conservation. Cornell University, 1995.

Diamond, Antony, R.L. Schreiber, W. Cronkite, & R.T. Peterson. Save the Birds. Houghton Mifflin, 1989.

Greenberg, Russell & J. Reaser. Bring Back the Birds. Stackpole Books, 1995.

Greenberg, Russell. Bridging the Americas: Migratory Birds in Costa Rica and Panama. Smithsonian Migratory Bird Center, 1993. (In English and Spanish)

Greenberg, Russell & S. Lumpkin. Birds Over Troubled Forests. Smithsonian Migratory Bird Program, 1991.

Greenberg, Russell. Southern Mexico: Crossroads for Migratory Birds. Smithsonian Migratory Bird Center, 1994. (In English and Spanish)

Hagan, J.M. & D.W. Johnston (eds.) Ecology and Conservation of Neotropical Migrant Landbirds. Smithsonian Institution Press, 1992.

Stoltz, D. Neotropical Birds: Ecology & Conservation. University of Chicago Press, 1996.

Terborgh, John. Where Have All the Birds Gone? Princeton University Press, 1989.

Videos

Birds Without Borders. New Hampshire Fish and Game Dept., 1992

The Kirtland's Warbler: Bird of Fire. Berlet Films, 1646 W. Kimmel Rd., Jackson, MI 49201. Phone 517) 784-6969.
10 minute video relates the life history of the rare Kirtland's Warbler and shows management efforts to create habitat and control nest parasitism.

Never a Silent Spring: Neotropical Migratory Bird Conservation in the Southeast. U.S. Fish and Wildlife Service, Office of Public Affairs, 1875 Century Blvd., Atlanta, GA 30345. Phone (404)679-7289.
22 minute video explores migratory bird problems and conservation efforts in the Southeast U. S.

On a Wing and a Song. CBC International Sales, Educational Sales Division, Box 500, Station A, Toronto, Ontario M5W IE6 Phone (416) 205-3482.
47 minute video looks at the world of songbirds, migration and their diminishing habitats. The program visits locations in Canada and Mexico.

Songbird Story Bullfrog Films, Box 149, Oley, PA 19547. Phone: (610) 779-8226.
15 minute children's video in which two children have an animated dream of migrating with songbirds to Central America. They witness rain forests being cut down for development.

For Students . . .

Stories

Atwood, Margaret. For the Birds. Firefly Books, 1990. A young girl doesn't think much about birds until she takes a strange journey and learns what life is really like for the birds.

Cherry, Lynne. Flute's Journey. Houghton Mifflin, 1997. The story of a Wood Thrush's first migration from Maryland to Costa Rica.

George, Jean Craighead. The Moon of the Winter Bird. Harper Collins, 1992.
During a cold spell in December, a song sparrow that has not migrated south must adapt to the changes that winter brings.

Keister, Douglas. Fernando's Gift - El Regalo de Fernando, Sierra Club, 1995. One day young Fernando who lives in the rain forest of Costa Rica goes looking for a favorite climbing tree only to find it cut down.

Montana Audubon

BBB Bird Guides: Key to...

Neighborhood Bird Guide/Winter-Feeder Birds

Common Migratory Birds

Neighborhood Bird Guide/Winter – Feeder Birds

1. Northern Flicker (Red-shafted Flicker) *Colaptes auratus*
2. Hairy Woodpecker *Picoides villosus*
3. Downy Woodpecker *Picoides pubescens*
4. Steller's Jay *Cyanocitta stelleri*
5. Black-billed Magpie *Pica hudsonia*
6. a. Black-capped Chickadee *Poecile atricapilla*
6. b. Mountain Chickadee *Poecile gambeli*
7. House Finch *Carpodacus mexicanus*
8. Red-breasted Nuthatch *Sitta canadensis*
9. White-breasted Nuthatch *Sitta carolinensis*
10. Bohemian Waxwing *Bombycilla garrulus*

Common Migratory Birds

1. Mountain Bluebird *Sialia curroides*
2. Western Bluebird *Sialia mexicana*
3. Red-tailed Hawk *Buteo jamaicensis*
4. Yellow Warbler *Dendroica petechia*
5. Yellow-headed Blackbird *Xanthocephalus xanthocephalus*
6. Red-winged Blackbird *Agelaius phoeniceus*
7. Barn Swallow *Hirundo rustica*
8. Tree Swallow *Tachycineta bicolor*
9. Eastern Kingbird *Tyrannus tyrannus*
10. Osprey *Pandion haliaetus*